BULLETIN 528 SEPTEMBER, 1933

Dependable Fruits

Varieties for Commercial and Home Use

C. W. Ellenwood and J. S. Shoemaker

OHIO
AGRICULTURAL EXPERIMENT STATION
Wooster, Ohio

This page intentionally blank.

CONTENTS

Introduction 3
Experiment Station Variety Trials 4
Breeding Work in Progress 4
Planting the Orchard 4
- Orchard Site 5
- Orchard Soil 5
- Time of Planting 5
- Planting Plan 6
- Laying Out the Orchard 6
- The Planting-board 8
- Setting the Tree 9
- Planting Distances 9

Apples 10
- Varieties Classified According to Use 10
- Varieties not Generally Cataloged by Nurseries 11
- Characteristics of Varieties 12
  - Summer and Fall Apples 12
  - Winter Varieties 15

Crab Apples 19
- Characteristics of Varieties 19

Pears 19
- Characteristics of Varieties 19
  - New Varieties of Pears 20

Quinces 20
- Characteristics of Varieties 20

Peaches 21
- Groups of Peach Varieties 21
- Characteristics of Varieties Listed in Order of Ripening 21
- Peach Varieties with Large, Showy Blossoms 26

Nectarines 26
Apricots 26
Cherries 26
- Groups of Cherry Varieties 26
- Characteristics of Varieties 27
  - Sour Cherry Varieties 27
  - Sweet Cherry Varieties 28
  - Duke Cherry Varieties 28

Plums 30
- Groups of Varieties 30
- Characteristics of Plum Varieties 30
  - Japanese Plums 30
  - European Plums 31

Grapes 33
- Characteristics of Varieties 33
  - European-type Grapes 35

Strawberries 35
- Characteristics of Varieties 35
- Fall Bearing 36

Black Raspberries 36
- Characteristics of Varieties 36

Red Raspberries 37
- Characteristics of Varieties 37

Purple Raspberries 38
- Characteristics of Varieties 38

Blackberries 38
- Characteristics of Varieties 38

Dewberry and Types with Trailing Growth 39
Currants 39
- Characteristics of Varieties 39

Gooseberries 39
- Characteristics of Varieties 39

Blueberries 39
Literature Cited 41

This page intentionally blank.

DEPENDABLE FRUITS

Varieties for Commercial and Home Use

C. W. ELLENWOOD AND J. S. SHOEMAKER

INTRODUCTION

More attention, both professional and practical, has been given to a consideration of varieties than to any other phase of fruit growing. In spite of the accumulation of much information concerning varieties, the selection of the proper ones for any given location or condition remains a serious and difficult matter. The development of new varieties and the testing of those recently introduced involve much work. Several years of observation are required to evaluate properly the merit of a variety. For these and many other reasons, there seems to be ample justification for continuance of variety trials by the experiment stations.

The comments on the varieties discussed in this bulletin are based mainly on their behavior in the Ohio Experiment Station orchards, vineyards, and small-fruit plantings. In most instances, however, the conclusions reached as to the value of a variety have also been influenced by its performance elsewhere in the State.

Within the past 10 years a great number of varieties has been introduced, many of which are the results of crosses made by experiment stations. Several of these varieties are now fruiting in the Station orchards at Wooster, and some of them are discussed in this bulletin.

The demands of the market in the past few years have, to some extent, altered the value formerly attached to certain varieties. Other factors such as insects and diseases are also focusing increased attention on the merits or faults of varieties; for instance, Grimes Golden, for many years a leading commercial apple in Ohio, has within the past 2 or 3 years met serious sales resistance because of its color. Cortland and some other varieties which were not included in Ohio Experiment Station Bulletin 394 seem to have sufficient merit to warrant including them in the present list of recommended varieties. The Oriental fruit moth, because of its more serious infestation of the later than of the earlier varieties of peaches, has caused new interest in early ripening sorts. In view of this, Golden Jubilee, a yellow freestone variety which originated at the New Jersey Experiment Station, gives promise of having considerable value. The susceptibility or resistance of certain varieties of small fruits to diseases has also altered the evaluation formerly attached to them. These experiences have also served to emphasize the need for improved strains and varieties.

The relationship between varieties, so far as pollination is concerned, is now better understood than it was a few years ago. Bulletins have been issued by this Station dealing with apple (4, 5) and cherry pollination (7).

The requirements of different varieties as to pruning, spraying, fertilizer treatment, and thinning are not fully understood, but it is well known that all of these practices have to be adjusted to meet varietal characteristics.

High yields are essential to profit, and varieties should be carefully scrutinized as to their possible production. Early bearing is generally desirable in all tree fruits, but equally important is the possible capacity of the tree to bear large crops when it has reached maturity. Yield records of a large number of varieties of apples growing in the Station orchards over a long period of years have been published elsewhere (2).

Although the total number of apple varieties now listed by American nurserymen is less than it was 20 years ago, at least 250 varieties are still offered for sale. Obviously, many of these varieties are not suited for planting in Ohio.

EXPERIMENT STATION VARIETY TRIALS

The first orchards, small-fruit plantings, and vineyards planted by the Station in 1893 were designed for variety trials. In recent years more emphasis has been placed on other phases of experimental work. However, the varieties now growing at the Station are quite extensive; over 400 varieties of apples and several thousand seedlings are under observation. Most of the other fruits are represented by proportionately large numbers of varieties. Varieties found not adapted to Ohio conditions are being eliminated each year and new ones added as they become available. Certain varieties of high quality which have been eliminated from the nursery trade because of shortcomings that keep them from being profitable are preserved in the Station orchards and serve as a source of propagating wood. Trees of many of the newer sorts growing in the Station orchards but not generally catalogued by nurserymen also serve as a source of scions or bud wood for both nurserymen and fruit growers. Thousands of bud sticks and scions are cut annually from the Station orchards. The large number of varieties grown in these orchards also serves as an aid in the identification of fruit.

BREEDING WORK IN PROGRESS

Several thousand seedlings propagated by the Department of Horticulture are growing at Wooster. Many have fruited but none have been named or disseminated. Most of these seedlings are the results of crosses made with a definite object in mind; for instance, several different crosses were made between late-blooming varieties. This character has been transmitted in many instances, and some of the resulting seedlings have been used in another series of crosses. It is hoped ultimately to develop one or more varieties of high quality and better color than some of the otherwise superior commercial sorts.

The recommendations as to the adaptability of a given variety to any section must be construed liberally. This information is suggested merely as a general guide and is not to be followed rigidly in all cases. It is well known that varieties may vary considerably within the same community, even on adjoining farms. It is not possible in a publication such as this to give detailed descriptions of the varieties; only the more important characteristics are given.

PLANTING THE ORCHARD

This bulletin has been prepared mainly to supply information on the merits of varieties of fruit for planting in Ohio. To make this information more serviceable to the fruit grower, brief planting instructions are also included. These planting directions are based on experience at the Station and

on a knowledge of the habit of growth of the several fruits. Detailed planting directions for strawberries may be found in Bulletin 444 (9) and for raspberries and blackberries in Bulletin 454 (10).

ORCHARD SITE

Even more important than the selection of proper varieties is the choice of a good orchard site. The two greatest hazards in growing tree fruits in Ohio are frost and inadequate soil moisture. The first consideration, therefore, in selecting a site for tree fruits should be to secure a location which seems reasonably immune from killing frosts during late April and early May. Usually, the highest elevation in a community is the freest from spring frosts. Topographical maps, showing elevations at frequent intervals, are generally available for reference in the office of the county surveyor. It is also important to study the temperature records and rainfall of the weather station nearest the proposed site. There are two regulation Weather Bureau recording thermometers located at the Experiment Station: No. 1 is located near the Administration building at an elevation of 1030 feet; No. 2, a mile distant from No. 1, is located at the edge of the Station orchards at an elevation of 1100 feet. The maximum temperature during May when apples are in bloom averages 2 degrees lower at the No. 1 weather station than at the higher elevation. In this particular instance in a rolling but not hilly section, 70 feet of elevation made a difference of 2 degrees in favor of the higher elevations. It is not suggested here that an equal difference in altitude between two locations elsewhere in the State would result in a corresponding difference in temperature. This experience is cited merely to show the value of giving careful thought to elevation. The relationship between the elevation of the orchard site and the surrounding country is more important than the elevation above the sea level. Care should be taken not to locate an orchard adjacent to a woodland where the natural flow of air currents to lower levels will be impeded. Such a condition causes "frost pockets" to form and results in frequent frost injury to the fruit. Areas known to be subject to frequent hail storms should be avoided.

ORCHARD SOIL

Orchards are grown on many types of soil in the State. Experimental work in orchard soils has not proceeded far enough to determine the best type of soil for the different kinds of fruit. However, a deep, well-drained soil, reasonably fertile and containing sufficient humus to facilitate the retention of moisture, can be rated as a good orchard soil. An impervious, hardpan subsoil should be avoided. Unless the soil is well drained naturally, a line of 4-inch drain tile should be laid at 40-foot intervals.

TIME OF PLANTING

Apples, sour cherries, pears, and the European varieties of plums can be planted either in the late fall or early spring. The other kinds of fruit should be planted in the spring.

Fall planting has certain advantages over spring. Frequently, the soil is in better condition. Weather conditions are generally more stable in late October or early November than in March or April, and there are also usually fewer windy days then; also, nursery stock is less apt to become overheated in transit during the fall than in the spring. A fall-planted tree becomes established through the winter and starts growth earlier than spring-planted trees.

When trees are planted in the spring it is necessary to get them set as early as the ground can be fitted; frequently, spring-planted trees fail to grow because of late planting. A compromise between fall and spring planting is to purchase the trees in the fall, have them delivered, and then heel them in by completely or partially covering them with dirt. This insures against a delayed delivery in the spring.

PLANTING PLAN

The two planting systems in most common use are the square and triangle systems [see Figs. 1 and 2 (6)]. In hilly sections the trees are frequently planted with the contour of the hill.

The square system is the easiest to establish and is more convenient for cultivation and spraying than any other system. Under this system, the trees may be aligned easily in all directions. It is also better adapted to the use of filler trees, Figure 1. When only semi-permanent trees in the center of the tree square are used as fillers, the square system virtually becomes a triangle arrangement. In the triangle system proper (see Fig. 2), however, the permanent trees stand equally distant from other permanent trees in each tree square. The triangle system offers the possibility of a more equal distribution of tree tops and roots in a given area. About 15 per cent more trees per acre can be planted under the triangle plan than the square.

Under the contour system of planting, the trees are set in rows spaced at equal distances following the natural contour of the hill. Perfect alignment is possible in only one direction. Such an arrangement in a hilly section makes it possible for sprayers and wagons to be conveyed over the ground more safely than if the square or triangle systems were followed.

LAYING OUT THE ORCHARD

The details of the several steps necessary in laying out an orchard were very concisely stated by I. P. Lewis (6) as follows:

> "The laying out of the orchard is sometimes a rather difficult problem, especially on rough or rolling ground, and should be carefully done in order to get the rows as nearly straight as possible in all directions. Carefully laid-out orchards with trees well aligned are most satisfactory both in attractiveness and ease of operation. The first step is to establish a base line along one side of the field, allowing ample space between the boundaries of the field and the first tree rows. A line fence or roadway may be used as a base line, or surveyor's instruments may be used to establish the line. Stakes are then set along this line at the proper distance for planting the first row of trees.
>
> "A carpenter's square or right angle made of wood strips is next set on three stakes at the end of this row or new base line placing the point of the square on the end stake. One side of the square brought in line with the base and by sighting along the other edge of the square a stake can be set establishing a line or row at right angles to the base line. This row is then measured off at tree distances and stakes set. The square is then moved to the end of this row and the system repeated until stakes are set on all four sides of the orchard area. If the ground is very uneven it will also be necessary to set rows of stakes through the orchard in both directions at distances

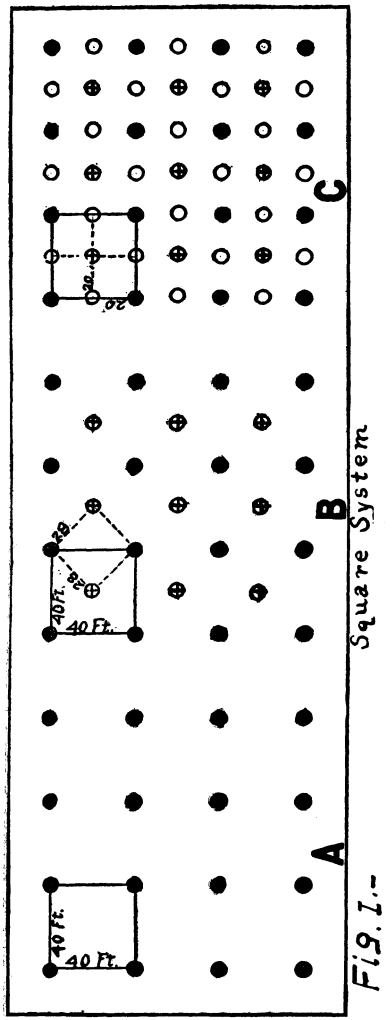

Fig. 1.—Square System

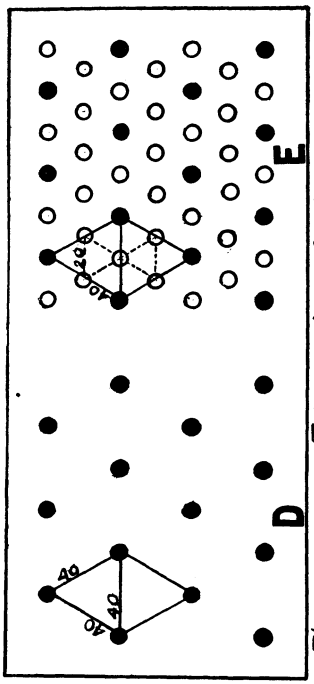

Fig. 2.—Triangular System

●---Permanent trees.
⊕---Semi-permanent trees.
○---Filler trees.

Note.—Figures 1 and 2 were prepared and presented by I. P. Lewis in the Bimonthly Bulletin of the Ohio Agricultural Experiment Station, March-April, 1924.

that can be readily seen. After this guide staking is done, three men set the stakes. The first sights in one direction, the second in the other direction, and the third man sets the stakes in position as signaled by the men doing the sighting. The guide stakes should be of light color and large enough to be seen readily. The remainder of the stakes need only be large enough to establish the position of the tree. If the ground is uneven a few long poles with the bark peeled off the top end so as to show white will be very useful for sighting.

"In staking an orchard for setting by the triangular or hexagonal method a base line is established along one side as before mentioned. Then a large triangle with a ring in each corner is made of heavy wire or chain, the sides of which are the length of the planting distance desired. By placing two of the rings over stakes on the base line the third ring will exactly locate a tree in the second row. By using each new row as a base line the remainder of the stakes may be set in like manner until the whole area is laid out.

"Another method used when only two men are available for the work is to prepare a wire in length equal to the exact distance the trees are to be planted apart and with a loop in one end large enough to hold a small pointed stick. One man then places the end of the wire at a stake on the base line and the other with the stick through the loop strikes a small segment of a circle upon the ground where he thinks the stake should go. The wire is then held to the next stake in the row and second segment struck crossing the first. Where these two segments cross is the location of a tree in the second row. Likewise the succeeding trees and rows are established.

THE PLANTING-BOARD

"No matter how carefully aligned the stakes may be, a planting-board should be used when digging the tree holes and in planting, to insure the trees being located exactly where the stakes stood. This board is about four feet long and six inches wide. A V-shaped notch is sawed in the center of each end. Then, in the center of the board and exactly midway between the notches in the ends, a hole is bored with an auger or large bit, and in turn, from one of the outer edges of the board and exactly opposite the hole in the center, saw out a section of wood between the hole and the outer edge, leaving a slot extending from the margin to the center of the board.

"Before beginning to dig a hole for a tree, place the planting-board on the ground with the stake marking the location of the tree in the slot exactly where the auger hole was bored. Next drive two short wooden pegs in the ground closely in the V-shaped notches in the ends of the board. The board then may be removed and the hole dug. The planting-board is then readjusted in its former position with the pegs engaged in the V-shaped angles at the ends. A few shovelfuls of the fine top soil is thrown in the bottom of the hole and the tree placed in position with its stem in the slot at the center of the board and the roots well spread out, shifting the roots one way or another until the body of the tree stands in a perpendicular position exactly where the stake formerly stood. A few shovelfuls of fine soil then may be worked in beneath, among and around the roots and the planting-board removed."

SETTING THE TREE

The size of the hole required to receive the tree depends upon the age of the tree and the root development. Where the ground is under cultivation the holes will not need to be quite as large as in sod. For trees of average size the holes should be at least 30 inches in diameter and 18 inches deep. Before planting, the broken roots should be removed. As the hole is filled the dirt should be firmed by tramping. Failure to set the trees firmly may cause the tree to loosen and result in injury to the trunk or roots. The top of the tree should be inclined towards the windward direction. If the location is subjected to strong winds, this tilting will need to be rather extreme. The tree should be set 2 or 3 inches deeper in the orchard than it was in the nursery.

PLANTING DISTANCES

The proper planting distances are determined by the fertility of the soil, growing habits of the variety, whether fillers are to be used and, if used, in what manner, and to some extent by the cultural and pruning practices which are to be followed. Convenience of handling such tools as sprayers, tractors, and cultivators in an orchard should also be considered in establishing the distances.

The Wealthy, being a relatively small tree, requires less space than a variety like Northern Spy, which develops into a very large tree. Trees on fertile soils attain greater size than on the less fertile soils frequently found in the hilly country.

The following distances are recommended for permanent planting:

	Feet
Apples	35 to 45
Pears	25 to 35
Peaches	20 to 22
Plums	20 to 22
Cherries, sour	20 to 25
Cherries, sweet	25 to 30
Quinces	10 to 15

To find the number of trees or plants required to plant an acre under the square or rectangular plan, multiply the distances of each side in feet and divide the product into 43,560 (square feet in one acre).

Table 1 gives the approximate number of trees or plants per acre when set at different distances.

TABLE 1.—Number of Trees or Plants Required to Plant an Acre

Planting distance	Square or rectangular method	Triangular method	Planting distance	Square or rectangular method	Triangular method
Feet			*Feet*		
1 x 4	10,890	.....	20 x 20	109	125
1½ x 3½	8,300	.....	22 x 22	90	104
3 x 8	1,815	.....	25 x 25	70	80
3 x 9	1,613	.....	30 x 30	48	56
4 x 8	1,361	.....	35 x 35	35	40
4 x 10	1,089	.....	40 x 40	27	31
8 x 10	544	.....	45 x 45	22	29
10 x 10	436	502	50 x 50	17	20
15 x 15	194	223			

APPLES

VARIETIES CLASSIFIED ACCORDING TO USE

In the following apple classification an attempt has been made to separate the varieties into three groups: (1) For commercial purposes, (2) for home use, (3) for roadside market. It is not to be understood from this grouping that a variety having been placed in one classification is eliminated from consideration in another but rather that a given variety should be considered primarily fitted for the use suggested; for instance, Grimes Golden, Jonathan, Delicious, and others listed for commercial uses are splendid varieties for home use. A few of the varieties listed for home use also have limited commercial value.

TABLE 2.—Varieties of Apples Recommended for Commercial Planting

Listed in approximate order of ripening

Lake Erie region	Northeastern counties	Eastern and southern counties	Southwestern counties	Central counties
Yellow Transparent	Yellow Transparent	Yellow Transparent	Yellow Transparent	Yellow Transparent
Oldenburg	Oldenburg	Oldenburg	Oldenburg	Oldenburg
Wealthy	Wealthy	Wealthy	Wealthy	Wealthy
McIntosh	Ohio Nonpareil			McIntosh
Cortland	McIntosh	Grimes Golden	Grimes Golden	Grimes Golden
Jonathan	Cortland	Jonathan	Jonathan	Jonathan
R. I. Greening	Belmont			
Delicious or Starking or Richared	Jonathan	Delicious or Starking or Richared	Delicious or Starking or Richared	Delicious or Starking or Richared
	R. I. Greening			
	Delicious or Starking or Richared			
Northern Spy or Red Spy	Northern Spy or Red Spy			
Winter Banana	Winter Banana			
Baldwin	Baldwin			
Stayman Winesap or Stamared or Blaxtayman	Stayman Winesap or Stamared or Blaxtayman	Stayman Winesap or Stamared or Blaxtayman	Stayman Winesap or Stamared or Blaxtayman	Stayman Winesap or Stamared or Blaxtayman
Gallia Beauty or Red Rome	Gallia Beauty or Red Rome	Rome Beauty or Gallia Beauty or Red Rome	Rome Beauty or Gallia Beauty or Red Rome	Rome Beauty or Gallia Beauty or Red Rome

For commercial purposes.—Yellow Transparent, Oldenburg, Wealthy, McIntosh, Cortland, Grimes Golden, Jonathan, Rhode Island Greening, Delicious (or Starking or Richared), Northern Spy (preferably Red Spy), Winter Banana, Golden Delicious, Baldwin, Stayman Winesap (or Stamared or Blaxtayman), Rome Beauty (or Gallia Beauty or Red Rome).

For home use.—Early Harvest, Melba, Golden Sweet, Joyce, Benoni, Lowell, Jefferis, Summer Pearmain, Garden Royal, Mother, Cox Orange, Rambo, Tompkins King, Sutton Beauty, Red Canada, Winter Sweet Paradise.

For roadside market.—In addition to those on the commercial list, Melba, Joyce, Chenango, Summer Rambo, Maiden Blush, Ohio Nonpareil, Red Gravenstein, Hubbardston, Wolf River; also, Dolgo, Transcendent, Whitney, and Hyslop crabs.

Certain apple varieties are adapted for use as fillers. Some of these are: Yellow Transparent, Oldenburg, Wealthy, Cortland, Jonathan, Wagener, Rome Beauty (preferably Gallia Beauty or Red Rome).

Likewise, the following new varieties are suggested as worthy of trial: Lodi, Early McIntosh, Milton, Glenton, Hume, Lobo, Medina, Orleans.

VARIETIES NOT GENERALLY CATALOGED BY NURSERIES

There is a number of varieties in the following list which for one reason or another are now cataloged by few, if any, nurseries. Most of these varieties are represented by one or more trees in the Station orchards. A limited amount of propagating wood of such varieties may be secured from the Station by either nurserymen or orchardists.

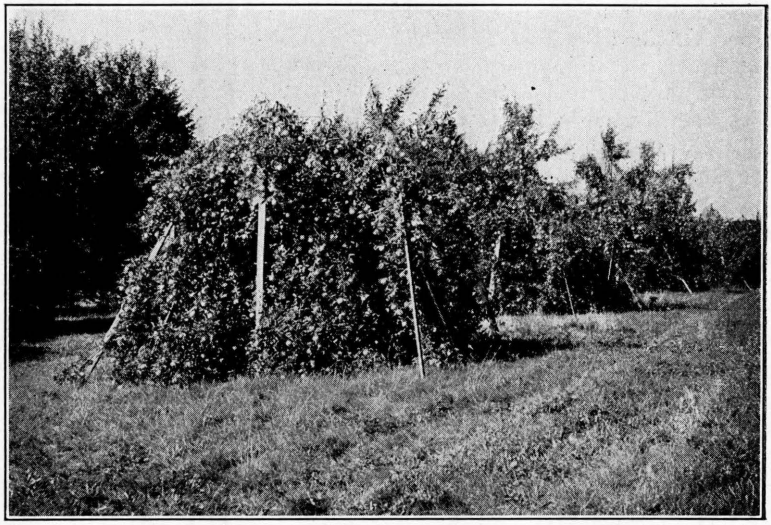

Fig. 3.—A corner of the Experiment Station apple variety trial orchard

Some of the older varieties which may be mentioned as having high quality and which are only rarely found listed in catalogs now are Benoni, Summer Pearmain, Garden Royal, Wismer, Cox Orange, and Rambo.

Several of the newer sorts which originated at the Central Experiment Station, Ottawa, Canada, are not widely propagated by American nurserymen. The varieties of this group which have fruited in the Station orchards and which seem to possess merit are also available for propagating wood.

CHARACTERISTICS OF VARIETIES

SUMMER AND FALL APPLES

The date of bloom, date of first picking, and yield that follow the descriptions are from trees planted on the Station grounds. In most instances the records from which these data were taken cover a 20-year period and were from trees in full bearing at the beginning of that period.

Yellow Transparent.—This is one of the earliest varieties and is well adapted to all sections of Ohio. It comes into bearing at an early age and, under most conditions, is a biennial bearer. Young, rapidly-growing trees are often seriously affected by blight, as are also the blossoms of mature trees. The tree is of rather small, upright growth and well adapted as a filler. Apples can be used early in July and are unusually good for cooking. May 8; July 24; 11.8 bushels.

Early Harvest.—This well-known, old variety is very susceptible to apple scab and blight and, because of this, cannot be recommended for commercial planting. However, the quality is so much better than Transparent, which is of the same season, that it is preferable to that variety for home use. May 6; July 24.

Lodi.—This new variety originated at the New York Experiment Station. It is similar to Transparent but probably larger and a week later. Where it is desirable to extend the Transparent season with a variety of that type, Lodi might be tried. It has not yet fruited sufficiently in this State to form definite conclusions as to its commercial value. The tree is said to be larger and more vigorous than Transparent.

Early McIntosh.—This is a New York Experiment Station McIntosh × Yellow Transparent cross. The variety has only recently been introduced into Ohio. It ripens 10 days later than Transparent. The color is similar to McIntosh and the flavor is somewhat like McIntosh but not as good. It seems doubtful now whether this variety will be as good for Ohio conditions as Melba, a variety which ripens a week or 10 days later. However, it is worthy of trial.

Oldenburg (Duchess).—This is one of the most desirable summer varieties for the commercial orchard, as well as for home use. The young trees grow rapidly and come into bearing at an early age, after which growth is much retarded by regular, and often heavy, crops of fruit. It is most useful as a culinary apple, being rather sharply acid for dessert. Young trees are often attacked by blight but not to the same degree as Yellow Transparent. The trees are hardy and, being of moderate growth, are well adapted as fillers. It is an early blooming variety. May 5; Aug. 6; 12.8 bushels.

Melba.—This variety originated at the Central Experiment Station, Ottawa, Canada, and is one of the varieties introduced by that Station which seem to have merit in Ohio. It is of the McIntosh type in general appearance and quality of fruit. Its season, early August, closely follows Oldenburg. It is the first apple of the season having excellent dessert quality. The Melba is recommended for trial, especially by persons catering to a roadside market. Fruit—medium size, attractively colored, the over color being a bright pinkish red with a heavy bloom. The flesh is tender and requires care in handling. The tree is moderately vigorous. May 6; August 12.

Joyce.—This variety has the same origin as Melba and, like that variety, takes on the McIntosh quality. The over coloring is a duller red than Melba,

and the color is likewise modified by a heavy bloom. The tree is vigorous; the fruit, medium to large. The variety is suggested for roadside or nearby markets. May 5; August 23.

Milton.—Milton is of the same origin as Early McIntosh. This variety is in season with Joyce and about equal in quality to that variety. The over color is an attractive bright red. Since the season of Milton overlaps both Joyce and Wealthy, it is suggested only for trial.

Golden Sweet.—This variety has the best quality of any of the sweet apples of its season. It ripens about the middle of August and is especially good for dessert and baking.

Benoni.—The small size of the fruit of this variety is fully counterbalanced by the attractive coloring and high dessert quality. The tree grows slowly, is upright in habit of growth, and bears alternate heavy and light crops. May 5; August 23.

Chenango (Strawberry).—This variety is very attractively colored, being a pale yellow, splashed and streaked with bright carmine. It is of good size, typically oblong-conic in form, and ripens in mid-August and early September. The quality is very good, having a pleasing aroma. The fruit is too tender to warrant extensive planting, but for roadside markets and home use it takes high rank.

Summer Pearmain.—This is an old variety of medium size, ripening in early September. It is of value only for home use, especially for dessert. The fruit lacks color and the tree is not productive enough to warrant including the variety in a commercial planting. May 8; September 2.

Garden Royal.—This little apple is of value only for the home orchard, but among varieties of its season or earlier it has no superior for dessert purposes. It ripens in late August.

Banks (Red Gravenstein).—So far as the character of the tree and form and quality of the fruit are concerned, this variety is not different from Gravenstein. It is more highly colored than this old variety. The quality is excellent, especially for all culinary uses, having no superior in its season for sauce or pie. It comes into bearing about 10 years from planting and produces alternate heavy and light crops. The size of the fruit is exceptionally uniform and, when properly thinned, medium to large. In recent years several red strains of Gravenstein have been developed. The first crops of the Red Gravenstein developed by the New York Fruit Testing Association indicate it may surpass Banks in color. May 5; August 26; 11.9 bushels.

Lowell (Queen Anne).—This is one of the best apples for home use in early September. Regular, moderate crops of apples of good size are produced. The tree is of moderately vigorous growth and somewhat susceptible to blight. The apples become very oily after picking; hence, the synonym "Tallow Pippin" often is applied to this variety. May 9; August 30; 9.4 bushels.

Glenton.—This variety originated as an open-pollinated seedling of the Northern Spy at the Central Experiment Farm, Ottawa, Ontario. The variety has been fruiting at Wooster since 1925. The tree is vigorous and productive and regular in bearing. It is picked in late August or early September. The fruit is of medium size and, as grown at Wooster, makes an attractive package. The quality is fair to good. It is suggested for trial.

Jefferis.—This is an excellent dessert apple in season during early September. The fruit is tender and adapted to local marketing only. The tree

makes rather slow growth, bearing alternate heavy and light crops. The season is short, and the fruit is best when picked ripe from the tree. May 8; September 1; 8.6 bushels.

Summer Rambo (Western Beauty).—The fruit of the Summer Rambo is much larger than that of Winter Rambo but it is equally good in quality. The tree is vigorous and open growing and bears annual crops. It is affected by blight in some sections of Ohio. The apples can be kept for several weeks in cold storage. Summer Rambo is distinct from English Rambo, a variety not extensively grown in Ohio; Summer Rambo is larger and more oblate than English Rambo, which is an early winter variety. May 8; September 4.

Wealthy.—This variety is well adapted to all parts of Ohio and desirable for both home and commercial orchards. It often begins to bear good crops in 5 years from planting; and, with the early rapid growth checked by fruit bearing, it makes one of the most desirable varieties to use as a filler. Mature trees of Wealthy are among the smallest of all standard apple trees and can be set much closer than most other varieties. The sharp acidity of the fruit when freshly picked is modified considerably by a few days of ripening after picking. Wealthy keeps well in cold storage until early December, provided the fruit is stored immediately after picking. Due to the fact that it is generally harvested at about the height of the peach season, the variety is frequently difficult to market profitably in years when apple production is normal or above normal. High temperatures also frequently prevail at that season, adding to the perishability of the harvested fruit unless placed in cold storage. Because of these handicaps, the writers suggest that careful consideration be given to possible market outlets and storage facilities before planting heavily of this variety. May 8; September 1; 7.7 bushels.

Hume.—It originated as an open-pollinated seedling of McIntosh at the Central Experiment Station, Ottawa, Ontario, and retains the McIntosh flavor. The color is also similar to McIntosh and under Ohio conditions may not always be bright enough to make it attractive. It is in season with Wealthy. The variety is worth a trial.

Maiden Blush.—This is a well-known and valuable variety ripening in September, adapted to both commercial and home orchards, and excellent for culinary uses. The variety is susceptible to attacks of apple scab and blotch and requires thorough spraying. May 9; September 10.

McIntosh.—Although one of the finest of all red apples, it is only partially adapted to Ohio conditions. It may be planted in a limited way in northern Ohio orchards and has a wider range in the State for roadside markets. The tree is upright, round or somewhat spreading, vigorous, and comes into bearing at an early age. It is prolific, producing alternate heavy and medium crops. The fruit is inclined to drop prematurely and often fails to color well. It keeps for several months in cold storage. May 7; September 18; 18-year average of trees 26 years old, 14.3 bushels.

Mother.—This variety is of the highest quality for both dessert and culinary uses among the fall varieties. The tree makes vigorous upright growth while young but is a little slow in coming into bearing, with growth much retarded when bearing age is reached. The fruit is susceptible to apple scab. This is one of the definitely late-blooming varieties. Fruit is best when picked while yet firm and allowed to ripen for a few days. It is adapted for the home orchard only. May 9; September 8.

Ohio Nonpareil.—This large apple ripens about the middle of September. It commands a ready sale in competition with all other varieties of the same season because of its size, attractive coloring, and good quality. It is especially valuable for roadside and local market. The variety has been grown sparingly in all sections of the State, but more especially in the northeastern quarter. It blooms early and is only moderately productive. May 4; September 18

WINTER VARIETIES

Cortland.—This variety is the result of a Ben Davis × McIntosh cross made at the New York Experiment Station. Cortland has now fruited for a sufficient length of time to appraise its value for this State fairly accurately. The variety seems worthy of addition to our list of commercial varieties for northern Ohio at least. The trees are vigorous and productive and come into bearing at an early age. It attains more color than McIntosh and is attractively covered with purplish bloom. The variety holds up well in common storage but loses its flavor rapidly after having reached its prime maturity for dessert. Because of this the variety should be stored in cold storage if it is to be held much later than December 1. The quality holds up well in cold storage. It is less susceptible to scab than McIntosh.

Lobo.—This is another promising McIntosh seedling from the Ottawa Station. The variety has many of the McIntosh characteristics. It is picked a week or 10 days later than that variety. The flavor is subacid and somewhat less pronounced than McIntosh. The variety looks promising but should have further trial before being recommended for general planting.

Grimes Golden.—This is a variety of excellent quality for all uses, coming into bearing at an early age and producing annual crops. It has given the highest average annual yield per tree among the varieties grown in the Station orchard. It is especially desirable as a filler. A serious weakness is the tendency to collar rot; otherwise, the tree is healthy, shapely, and of moderately vigorous growth. The Grimes is better adapted to the southern than to the northern half of the State. Some markets discriminate against this variety because of its color. This sales resistance seems to be on the increase. May 7; October 2; 21.4 bushels.

Hubbardston (Nonesuch).—This is of nearly the same season as Grimes and of excellent dessert quality. The tree is moderately vigorous, of spreading bushy growth, and somewhat susceptible to blight. It is best adapted to the northern counties of the State or wherever the Baldwin is grown successfully. It is very mild and, hence, not a good cooking apple, except for baking for which purpose it excels. It is increasingly difficult to sell. May 8; October 4.

Tompkins King.—The King undoubtedly is not at its best in Ohio. Though a shy bearer, still its excellent quality for both dessert and culinary uses justifies its planting in a limited way for home use and local market in a few of the favored sections of the Lake Region where the variety seems to do best. It is ready for use in early winter. May 6; October 4.

Rhode Island Greening.—This is another good variety for northern Ohio, but in the southern part of the State the fruit ripens prematurely and drops early. The tree is of large spreading growth and sometimes is affected with blight. It is scarcely surpassed as a cooking apple in early to midwinter. It may be safely planted in a moderate way in the north. May 7; October 6; 16.7 bushels.

Jonathan.—A bright, attractive color, high quality, and early bearing make this variety desirable as a fancy market apple. The tree is of slender, spreading growth and requires rich soil, in which it gains vigor with age; it is sometimes severely attacked by blight. It can be used either as a permanent or filler tree. May 8; October 8; 14.1 bushels.

Belmont (Gate, Mamma Beam).—This yellow apple is commonly grown in the eastern counties and finds a ready market in the vicinity of Youngstown. It seems to attain its highest degree of perfection in that section. The fruit at its best is of excellent quality for both dessert and cooking. The skin and flesh are tender, which, together with its color, render it of little value commercially aside from districts in which it is favorably known. The tree is moderately vigorous, but the wood is brittle and subject to canker.

Delicious.—This is a highly flavored dessert apple for early winter use, which, despite extensive planting, commands a high price on all markets. The tree is of vigorous growth and begins bearing at 6 to 8 years from planting on the lighter soils but is often tardy on heavy, poorly drained soil. It is nearly free from blight and seems to withstand root rot, a weakness to which certain other varieties grown in the State are quite susceptible when planted on soil not properly drained. However, it is seriously affected by apple scab if not carefully sprayed. The fruit is inclined to become mealy and to lose flavor after maturity, which is reached in cellar storage in early winter. May 8; October 10.

Richared and Starking.—These are red sports or strains of the Delicious, which have recently been offered to the public. The only apparent difference between them and the Delicious is their solid red color which develops early in the ripening period. They seem to be a valuable addition and to warrant planting in preference to the original strain.

Medina.—This variety is a New York Experiment Station cross between Deacon Jones and Delicious, which is just coming into fruiting in Ohio. In New York, the fruit is said to be of the Delicious type in form and color but larger than that variety. The season of this variety is later than that of Delicious. It is recommended now only for trial in Ohio.

Orleans.—It was originated as a sister plant to Medina and is similar to that variety in appearance but is a little later in season. This variety possesses a Delicious-like flavor but is a little more acid. It is likewise suggested only for trial.

Northern Spy.—This is one of the late-blooming varieties adapted to the northern part of the State. The tree is vigorous and healthy and should be given ample space to develop; it is often slow in coming into bearing but with age bears good to heavy annual crops. The fruit has the highest quality for all uses, especially for cooking. May 10; October 10; 11.6 bushels.

Red Spy.—This new variety has not fruited extensively in Ohio. Except for color, it is apparently like Northern Spy in all other characters. Being much more highly colored than the original Spy, it seems safe to expect it to supplant that variety.

Rambo.—Rambo is an old favorite of high quality but rather small in size, best adapted to the home orchard and for local markets. Young trees grow rapidly and produce the largest fruit. Thorough spraying is necessary to check apple scab. May 7; October 10; 10.9 bushels.

Sutton (Beauty).—The tree is upright in habit of growth, is a little slow in reaching fruit-bearing age, but bears good crops of highly colored fruit of excellent quality. The fruit is exceptionally uniform in size. It is susceptible to attacks of blight in the Station orchard. It is winter-injured on the trunk in years of low temperature. Sutton is adapted to box-packing and, when well grown, is desirable as a fancy market apple. It can scarcely be placed in the primary list of commercial apples. May 6; October 10.

Winter Banana.—This variety has been planted generally throughout the State but is better adapted to northern Ohio because of its tendency to drop farther south. Fruit is excellent for culinary use in early winter and best adapted for home use or to methods of shipping suited to the handling of tender-skinned yellow apples. The tree is productive, moderately vigorous, and spreading with age and fruit bearing; it is sometimes seriously attacked by blight and liable to sunscald on branches bent down by heavy crops. It is recommended for limited commercial planting only. May 8; October 12; 14.3 bushels.

Baldwin.—Within rather clearly defined climatic limits, especially in the counties bordering on Lake Erie, this variety is of first rank as a commercial winter apple. Local variations of soil in more southern counties seem to make up the deficiency in climate and favor the production of fruit of excellent color and flavor. The tree is vigorous, with large, spreading growth, is slow in coming into bearing, and nearly always has a pronounced biennial bearing habit. The fruit is often seriously affected by "Baldwin spot". May 7; October 15; 14.9 bushels.

Golden Delicious.—No apple upon its introduction ever attracted wider attention from the fruit grower and consuming public than this variety. The variety has now been in fruiting for 10 years or more in various sections of the State. The experience with the variety has been varied. When well grown it attains good size, is attractively colored, and is of excellent quality. The trees are vigorous and productive and bear young. The main objections to the variety are: (a) Its color, which meets with sales resistance where there is a prejudice against a yellow apple; (b) the tendency of the variety to shrivel in storage. This second weakness is partially corrected by using dilute sprays in all the after-bloom applications, picking at the proper time, handling the fruit carefully, and packing it in oiled paper (1). Whether it should be ruled out as a commercial sort depends upon whether or not the market where it is to be sold will pay enough premium to justify the additional expenses required. Because of the high quality of the fruit, it certainly deserves to be planted for home use if for no other purposes. The flavor is similar to Grimes but less acid. When grown in such a way that it develops the waxy finish, the quality is retained late in the season. May 10; October 15-20.

Red Canada (Steele's Red, Richfield Nonesuch).—It is not as widely known a variety as it deserves to be. Its behavior indicates an adaptation similar to that of the Baldwin. The tree is of slender growth and does better when top-grafted on vigorous stock. The fruit is of high quality, matures in early winter, and retains its good quality for a long period. The average annual yield of this variety during the first 35 to 40 years of the life of the tree at Wooster has been slightly less than Baldwin. The fruit usually averages a little smaller than Baldwin and requires rather severe thinning in full-crop years. May 8; October 16; 12.5 bushels.

Rome Beauty.—This apple predominates in the commercial orchards of southern and southeastern Ohio. The limit of commercial usefulness of Rome Beauty extends further north than was formerly supposed. The variety has given a good account of itself as far north as Wooster. The tree is of upright, moderately vigorous growth, reaching bearing age 8 or 10 years from planting and usually fruiting annually. It blossoms several days after most other varieties. Both leaves and fruit are subject to attacks of apple scab and require thorough spraying. The fruit is of moderate quality, becoming somewhat mealy in late winter. The red strains—Gallia Beauty and Red Rome—are both distinctly superior in color and seem to be nearly identical otherwise and, hence, should replace Rome Beauty. May 11; October 22; 16.9 bushels.

Gallia Beauty and Red Rome.—These two apples originated in southern Ohio and are solid red in color rather than striped red. In other characteristics they appear to be practically the same as Rome. They may be successfully grown as permanent or filler trees in northern Ohio and are preeminently adapted to southern Ohio. Because of the superior color of these red strains of Rome Beauty they are preferred to the original variety. The Rome Beauty type seems to be particularly adapted to Ohio. While these varieties do not develop as good dessert quality as a number of other sorts grown commercially in the State, there is probably no other red variety as dependable in production. Spring frost is the greatest single hazard the apple grower has to face in Ohio. Of all the commercial sorts grown in this State, Rome Beauty and the red strains of that variety blossom the latest and are most apt to escape frost injury. Gallia Beauty and Red Rome bloom at the same time as Rome Beauty.

Stayman Winesap.—Stayman is the best of the Winesap group for Ohio. The tree is vigorous, open, of spreading growth, usually free from disease, and begins to bear at 5 or 6 years from planting, often in annual crops. It is an all-winter apple, keeping in good condition for several months after maturity. As with other members of the group, a susceptibility to apple scab makes spraying against this disease essential. The weaknesses of this variety are: (a) Tendency of the tree toward winter injury; (b) failure of fruit to attain attractive color in some sections of the State; and (c) cracking of the apples preceding picking time. The mature trees of this variety require annual pruning of a somewhat heavier nature than many varieties in order to assure good color. May 8; October 23; 10.8 bushels (20-year average from 30-year-old trees).

Stamared, Blaxtayman.—These two new bud sports, red strains of Stayman Winesap, are too new to estimate their full value for Ohio conditions. They seem to be like the parent variety except in color; they are more solidly colored. The demand of the market is for a bright red, and, if these new varieties attain a brighter cherry-like red than Stayman Winesap, it is probable they will largely supplant that variety.

Turley.—This Winesap seedling which originated in Indiana has attracted much favorable notice in that State. In the Station orchards the Turley trees resemble Stayman in form and bearing habits. The fruit, however, is more like Arkansas (Mammoth Black Twig) than Stayman Winesap. Apparently, the tree comes into bearing reasonably early and is productive. Thus far at Wooster the quality of the fruit has not equalled that of Stayman Winesap. The fruit, however, has colored rather uniformly throughout the tree but, on the whole, is a little duller in appearance than well-colored Stayman Winesap.

The fruit has never shown any tendency towards cracking in the Station orchards. The variety should be planted for trial, but the first few years of experience with it in the Station orchards at Wooster do not indicate that the variety will have sufficient quality to warrant planting it as a substitute for Stayman Winesap. May 8; October 23.

Winter Paradise.—A desirable sweet winter apple; it is somewhat slow in coming into bearing but often bears heavy biennial or alternate heavy and light crops with age. The fruit is at its best in midwinter and keeps well after maturity, often until March to April. May 7; October 24.

CRAB APPLES

CHARACTERISTICS OF VARIETIES

Dolgo.—This variety originated in Russia and was introduced into America by Prof. N. E. Hansen of the South Dakota Experiment Station in 1897. The tree is the most striking in appearance at picking time of any variety tried at the Station. The coloring of the fruit is a brilliant crimson and makes the tree very showy for a considerable distance. At blooming time the tree is also very attractive. The fruit is rather small, very distinct in form, being rounding conic. The quality is good for culinary uses, and the variety is especially recommended for decorative uses. May 8; Mid- to late August.

Transcendent Crab.—The Transcendent is one of the most beautiful of the crabs, both at blooming time and when the fruit is coloring. The fruit is of good quality and medium size. The tree is moderately vigorous, spreading, and productive. Although, like most crabs, it is subject to blight, it can be recommended as one of the best varieties. It ripens about September 1, a little early to command the highest price. May 7.

Whitney.—This is the largest of the crabs and the best for dessert. The tree is of upright growth. Although lacking the brilliant coloring of the Transcendent, it is one of the best crabs. Season, mid-September. May 8.

Hyslop.—This variety is perhaps the best of the crabs for commercial purposes, as it ripens in late September when crab apples are more in demand. The trees are small and moderately vigorous. The fruit is of medium size and is pale yellow covered with dark crimson and overspread with a heavy bloom. May 7.

PEARS

CHARACTERISTICS OF VARIETIES

Wilder.—Generally regarded as the best very early variety. It has good quality but is too small for market.

Bartlett.—The best known and most popular summer variety for home use or market. The tree is subject to blight, the blossoms are self-sterile, and the foliage often drops prematurely. In sections close to the Lake, blight is not often serious.

Angouleme (Duchess).—A standard, late fall variety. Fruit large and of high quality; prolific. It is best as a dwarf.

Seckel.—A small, sweet pear of highest quality. The tree is somewhat slow in growth and slow in coming into bearing but is vigorous, productive, long-lived, and comparatively free from blight.

Worden Seckel.—A seedling of Seckel, resembling that variety in color, form, and quality. It ripens about the same season as Seckel but is larger than the parent variety. Worden Seckel is not always as reliable as Seckel. It can be recommended for limited planting where a pear of the Seckel type is desirable.

Sheldon.—A large russet pear, sweet, of the highest quality, and unsurpassed for dessert. The tree is fairly vigorous, with little susceptibility to disease, but is rather unproductive. The Sheldon should be planted for home use only.

Kieffer.—A widely grown variety. The fruit is of low quality, being useful only for culinary purposes, and even inferior to the other varieties in this list when cooked. It should never be used until fully mature. The tree is prolific and an early bearer and is subject in varying degrees to blight. The fruit should be ripened off the tree.

Beurre d' Anjou.—A standard commercial pear for late fall and early winter. The tree is vigorous and hardy. The blossoms have a tendency to fail to set, especially on young trees, and, hence, it is an uncertain cropper. The fruit is large, tender, juicy, and sweet. Because of uncertainty in cropping, it should be tested locally before heavy planting.

Lawrence.—A reliable winter variety; prolific, of good quality, and comparatively free from disease.

Winter Nellis.—A sweet, rich pear for winter use. The trees are not very vigorous but are adapted to most soils and are productive. For home and market.

Beurre Bosc.—A handsome russet pear, characteristically pyriform, and highest in quality. The trees are slow-growing and are late in coming into bearing but, when once established, are a valuable acquisition to the home orchard. Its commercial status for Ohio is not fully determined. It seems worthy of careful trial.

NEW VARIETIES OF PEARS

Several new pear varieties, the results of breeding work at the New York Experiment Station, have been recently introduced. These varieties have been disseminated through the New York Fruit Testing Association, Geneva, New York. From the first few years' experience with these varieties in the orchards at Wooster, the following are suggested at least for trial by Ohio growers:

Cayuga.—Seedling of Seckel but about the size and season of Bartlett. Form and quality similar to Seckel.

Gorham.—A pear of Bartlett type but later than that variety. This variety seems very promising.

Conference.—Ripens somewhat later than Bartlett. Medium size. Good quality.

Phelps.—A cross between Winter Nellis and Russet Bartlett. Fruit of Bartlett type but 6 weeks later.

QUINCES

CHARACTERISTICS OF VARIETIES

Orange (Apple).—The best known and most widely planted variety of this fruit. Name more often applied to group than variety.

Champion.—Later than Orange and usually more pear-shaped. Probably the best of the quince varieties.

PEACHES

GROUPS OF PEACH VARIETIES

In attempting to remember characteristics of peach varieties it is helpful to classify them into groups.

Alton group.—Examples: Carman, Champion, Greensboro, Mayflower. White flesh; juicy; soft; clingstone to semi-free; hardy; mostly round; small to medium size; generally ripening early to early midseason.

Crawford group.—Examples: Early Crawford, Late Crawford, St. John, Rochester, South Haven, Captain Ede, New Prolific, Niagara, Engle, Kalamazoo. Yellow flesh; rich flavor; more or less globular to oval shape; attractive; skin rather tender; mostly freestone; variable size.

Elberta group.—Examples: Elberta, Wilma, Salberta, J. H. Hale. Yellow flesh; firm; stone free or practically so; mostly oval to elliptical shape; quality usually only fair for eating out of hand but the best for shipping and commercial handling; medium to large size; generally ripening at or near midseason.

Krummel group.—Examples: Krummel, Lemon Free, Gold Drop. Flesh yellow, rather dry, fairly firm, uniformly colored to the pit; skin not prominently red colored; ripening later than midseason; freestone; canning quality primarily.

Oldmixon group.—Examples: Oldmixon, Belle of Georgia, Stump, Hope Farm. White flesh; often moderately juicy; medium firmness or slightly softer; round to long oblong shape; variable freestone; ripening mostly near midseason; good flavor.

Salwey group.—Examples: Salwey, Smock, Banner. Yellow flesh; rather dry; only medium size; fair quality; moderately firm; late; freestone; more red coloring than the Krummel group, but less attractive and poorer quality for eating out of hand than the Crawford group.

Heath Cling group.—Examples: Heath Cling. White flesh; tough; tenacious clingstone; late ripening; fair quality; limited value for pickling purposes.

Yellow Clingstone.—Williams Cling is probably the chief firm, yellow-fleshed, tenacious clingstone variety grown in Ohio. It is esteemed for pickling. The yellow clingstone varieties which are extensively grown in California are not suitable for growing in Ohio.

Arp Beauty group.—Examples: Arp Beauty, June Elberta, Admiral Dewey. Yellow flesh; clingstone; rather soft; small to medium; early; poor to fair quality.

Blood Cling group.—Examples: Japan Dwarf Blood. Reddish flesh; clingstone; rather acid.

CHARACTERISTICS OF VARIETIES LISTED IN ORDER OF RIPENING

The Elberta has predominated in commercial peach plantings in Ohio. It has also been the leading variety in all regions east of the Rocky Mountains. Most of the "ups and downs" of the eastern peach industry, especially the marketing problem, have been associated with the Elberta variety.

The tendency at present in Ohio is not to concentrate so heavily on Elberta but to grow a succession of varieties ripening earlier than Elberta and to develop local sales. The following preferred list is arranged in accordance

with the above tendencies. *Yellow-fleshed*—Golden Jubilee, Rochester (where hardiness outranks other factors), South Haven, Early Elberta, Elberta. *White-fleshed*—Belle of Georgia.

Mayflower.—White; clingstone; round; small; soft to a limited extent. It serves, because of its early season, to satisfy the longing for the first local peaches. Limited value.

Greensboro.—White; semi-cling; small to medium; notably hardy; only fair quality; soft; limited value.

Golden Jubilee.—Yellow. Although its test in Ohio has been limited to 2 years' observations, its behavior and characteristics have seemed very favorable. It ripens slightly earlier and with the Carman variety. It is considered to be the earliest worth while yellow-fleshed peach. Stone free or practically so; firm for an early variety; medium size; thinning early in the season may be necessary to promote good size in years of heavy crops; oval to elliptical shape; good quality. The tree characteristics might be somewhat more desirable.

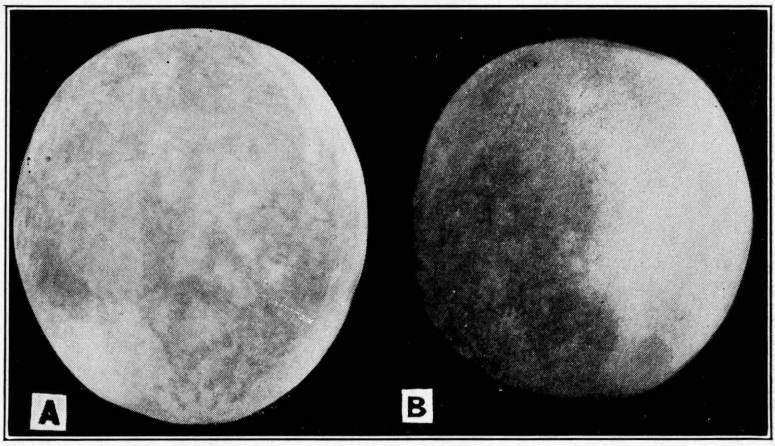

Fig. 4.—A. Cumberland peach. B. Golden Jubilee peach

Carman.—White; semi-cling; round shaped. It is one of the most hardy and productive of all peaches. It is fairly good in quality for eating out of hand or slicing but is poor for canning. The fruit is attractive when picked from the tree but is too soft for handling.

Cumberland.—It seems to be well worthy of trial as a white-fleshed variety to replace Carman. The fruits of Cumberland are white, practically freestone, large, and oval, and they set wider throughout the tree than is the case with Carman.

Radiance.—White; good size; high quality; hardy. Well worthy of trial.

Rochester.—Yellow; freestone; round; fuzzy; medium size; rich flavor; rather long ripening season; considerably hardier than Elberta; none too consistent in behavior; requires careful attention as to thinning, fertilizing, and various cultural practices.

South Haven.—Yellow; round; freestone; rich flavor; moderately firm; none too consistent in behavior. When well grown it deserves the rank of a commercial variety in Ohio.

Champion.—White; stone not quite free; especially rich flavor; round; soft; variable size; usually medium to below; very subject to rot. Largely on account of its rich flavor it is considered by some to be the best white-fleshed peach.

Early Crawford.—Yellow; freestone; oval; variable in size, usually medium; rich flavor; tender flesh; light production. The planting of this variety is decreasing.

Early Elberta.—Yellow; freestone; smaller, more lemon colored, a few days earlier, softer, and with richer flavor than Elberta. Blossoms of this variety are very large in contrast to the medium sized ones of Elberta. It deserves the rank of a commercial variety.

TABLE 3.—Peach Varieties—Order and Dates of Ripening, Yield and Size at Wooster

Variety	Color	Planted	First picking†		Yield		Size (2¼ in. up), 1932
			1931	1932	1931	1932	
					Bu.	*Bu.*	*Pct.*
Mayflower	White	*	July 15	.....	.....	.....	.....
June Elberta	Yellow	*	29	.....	.....	.....	.....
Buttercup	Yellow	1927	29	Aug. 5	3.0	2.0	0
Marigold	Yellow	1927	Aug. 6	5	1.0	1.7	0
Greensboro	White	*	7	.....	.....	.....	.....
Arp Beauty	Yellow	*	10	.....	.....	.....	.....
Rosebud	White	1927	14	.....	2.0	.....	.....
Pioneer	White	1924	20	Aug. 13	5.5	4.7	10
Golden Jubilee	Yellow	1927	23	13	2.8	3.8	22
Cumberland	White	1927	26	13	1.0	5.0	54
Carman	White	1926	26	22	7.0	5.8	38
Radiance	White	1927	27	16	2.0	4.5	42
St. John	Yellow	*	27	.....	.....	.....	.....
Rochester	Yellow	*	27	.....	.....	.....	.....
Vedette	Yellow	1929	27	Aug. 18	0.2	0.8	52
Valiant	Yellow	1929	30	29	0.8	1.3	30
Slappey	Yellow	*	30	.....	.....	.....	.....
South Haven	Yellow	1924	30	Aug. 28	4.5	5.0	39
Hiley	White	*	31	.....	.....	.....	.....
Captain Ede	Yellow	*	Sept. 1	.....	.....	.....	.....
Veteran	Yellow	1929	2	Aug. 29	2.0	2.0	10
Engle	Yellow	*	5	.....	.....	.....	.....
Eclipse	Yellow	1927	5	Aug. 25	1.5	3.3	28
Champion	White	1926	7	Sept. 2	2.0	3.2	35
Early Crawford	Yellow	*	8	.....	.....	.....	.....
Early Elberta	Yellow	1923	8	Sept. 3	8.6	6.8	43
Primrose	Yellow	1924	8	4	1.5	5.5	20
New Prolific	Yellow	1923	9	2	7.1	5.3	9
Heidelberg	Yellow	1923	9	6	.....	6.4	43
Niagara	Yellow	*	9	.....	.....	.....	.....
Belle of Georgia	White	*	9	.....	.....	.....	.....
Fitzgerald	Yellow	1923	10	Sept. 3	3.5	2.3	60
Big Red	Yellow	1927	10	6	.....	5.0	34
J. H. Hale	Yellow	1923	11	8	6.5	1.3	100‡
Elberta	Yellow	1924	12	10	6.4	5.3	88
Stump	White	*	15	.....	.....	.....	.....
Oldmixon	White	1923	15	Sept. 9	8.0	4.9	37
Crosby	Yellow	*	17	.....	.....	.....	.....
Hope Farm	White	1927	17	Sept. 14	2.5	4.1	72
Kalamazoo	Yellow	1923	18	18	8.0	3.7	40
Late Crawford	Yellow	*	18	.....	.....	.....	.....
Wilma	Yellow	1926	18	Sept. 14	7.0	3.8	80
Day's Nonpareil	Yellow	1923	19	28	7 9	3.9	28
Gold Drop	Yellow	1923	21	24	6.9	4.8	2
Williams Cling	Yellow	*	23	.....	.....	.....	.....
Banner	Yellow	1923	23	Sept. 24	7.7	3.8	57
Lemon Free	Yellow	1923	26	30	4.1	4.0	60
Salberta	Yellow	1923	28	24	10.3	3.0	95
Smock	Yellow	1923	Oct. 12	30	6.5	5.3	16
Heath Cling	White	1923	15	Oct. 10	11.2	5.0	17
Salwey	Yellow	1923	20	18	.....	4.8	1
Krummel	Yellow	*	24	.....	.....	.....	.....
Bilyeus Late	White	1923	29	Oct. 27	.....	2.3	7

*Not now growing at Wooster. Estimated from crops of previous years.
†The length of season for all varieties averages 10 days.
‡These J. H. Hale peaches were unusually large and practically all had split pits.

Belle of Georgia.—White; freestone; roundish oval in shape; ripens a few days to a week earlier than Elberta and just a little later than Champion which it overlaps. It is considered as the most suitable commercial white-fleshed variety, although as a rule its value for this purpose is limited in comparison with yellow-fleshed sorts. In handling for market, though by no means firm or resistant to brown rot, it is superior in these respects to Champion.

Big Red.—Yellow; freestone; oval shaped; begins to ripen a few days earlier than Elberta; of some value for local trade because of its high color and good quality; only medium in size but rather uniformly so.

J. H. Hale.—Yellow; freestone; very large but variable with a heavy crop (even when interplanted with other varieties and thinned, a high percentage of the fruits may not develop properly); firm; rich; light fuzz; round; self-unfruitful. Less hardy, less productive, and shorter lived than Elberta. A favorite variety of the purchaser but not equally well liked by the grower, even though it frequently brings a premium over Elberta.

Elberta.—Yellow; freestone; oval to elliptical shape; large; only moderately hardy in bud; eating quality only fair; handling quality excellent; vigorous, thrifty tree. By far the leading commercial peach in the State.

The following varieties ripen later than Elberta. With all of them the problem of wormy peaches, due to the Oriental fruit moth, is serious. At present, no satisfactory control for the pest is available. This fact should be kept in mind when considering the planting of late ripening peaches.

Hope Farm.—White; freestone; oval; medium size; a good white variety where this sort is desired to follow Elberta. It is one of the latest blooming of the peach varieties; this characteristic enables it to escape frost in some seasons. It has been freer from worms than most other varieties ripening after Elberta.

Late Crawford.—Yellow; freestone; medium size; fairly good quality; light production.

Wilma.—Yellow; freestone; large; somewhat finer grained than Elberta. Its appearance is not very attractive because of a dull brick-red coloring. The tree is not so hardy as could be desired.

Gold Drop.—Yellow; freestone; small; uniformly yellow colored to the pit and thus well adapted to canning; however, the small size of the fruit is a serious drawback.

Williams Cling.—This is probably the leading yellow clingstone peach grown in Ohio, but its planting is limited both with respect to distribution throughout the State and with respect to the number of trees in any one orchard. There is a limited demand for clingstone peaches for pickling purposes. The clingstone peaches which are extensively grown in California are not adapted to Ohio conditions.

Banner.—Yellow; freestone; oval shape. Its time of ripening, which is 10 days to 2 weeks later than Elberta, has given it a place in many orchards. Also, it is reasonably hardy, productive, highly colored, and of good quality. The fruit is often undersize and, like other late peaches, is wormy, and the tree is not so strong as could be desired.

Lemon Free.—Yellow; firm; freestone; medium size; unattractive appearance; fuzzy; flesh rather dry; yellow to the pit; inclined to split and drop unevenly. Well liked for home canning by those who know the tree. Tree often none too thrifty.

Salberta.—Yellow; stone not quite free; only fair for eating out of hand; fairly good for canning. It is productive of medium to large fruits which are of firm handling quality; thrifty tree.

Smock.—Yellow; freestone; small to medium; oval; variable quality; tree notably large.

TABLE 4.—Peach Blooming Dates, Wooster

Variety	First bloom	Full bloom	Last bloom
5-year average, 1926-1932			
Brackett	April 24	April 29	May 3
Heath Cling	29	30	4
Early Elberta	23	27	4
Salberta	25	29	5
Bilyeus Late	23	28	4
Oldmixon	24	30	4
Fitzgerald	23	29	4
J. H. Hale	24	29	5
Banner	25	30	4
Beer's Smock	25	29	4
Gold Drop	22	28	4
New Prolific	24	28	4
Kalamazoo	24	28	4
Winstone	26	30	4
Elberta	23	29	4
Day's Nonpareil	25	29	4
Lemon Free	23	28	5
Heidelberg	24	30	4
Salwey	25	30	4
Pioneer	26	30	4
Wilma	23	28	3
South Haven	24	29	5
4-year average			
Carman	April 20	April 27	May 4
3-year average			
Buttercup	April 17	May 4	May 5
Kihlken Smock	20	April 25	4
Champion	18	25	4
Florence	17	24	4
Big Red	18	25	3
Seneca	18	25	4
Clyde	20	25	4
Early Ohio	20	26	4
Golden Jubilee	20	26	4
Eclipse	19	25	5
Marigold	20	25	5
Goldmine nectarine	18	24	4
Marion Hayward	18	25	2
Cumberland	18	24	5
Radiance	18	24	5
Hope Farm	20	25	4
2-year average			
Vedette	April 23	April 29	May 5
Valiant	23	30	4
Veteran	23	30	3
Hunter nectarine	24	May 1	4
Primrose	26	1	3
Victory	18	April 25	3
1-year record			
Kette	April 23	April 27	May 1
Wooster	24	28	3

Heath Cling.—Large; white-fleshed; tenacious clingstone variety, which is held in limited esteem for pickling purposes.

Salwey.—Yellow; freestone; small to medium; does not always ripen properly. In former years it was planted extensively, but it has lost greatly in favor in recent years.

PEACH VARIETIES WITH LARGE, SHOWY BLOSSOMS

In the planting of peach trees in the home garden or in other places where the appearance of the trees during bloom might well receive some attention, consideration should be given to varieties with large, showy blossoms. Some varieties with this kind of blossoms are:

White-fleshed—Carman, Alton, Greensboro, Cumberland, Radiance, Bilyeus.

Yellow-fleshed—Lemon Free, Wilma, Early Elberta, Gold Drop, Vedette, Veteran, Marigold, Buttercup, Florence, Seneca, Eclipse.

NECTARINES

Nectarines are simply fuzzless peaches. They arise mostly from peach seeds and occasionally by bud variation. Their leaves are identical with peach leaves. The fruit may be yellow or white. Two varieties are fruiting at Wooster; namely, Goldmine (white-fleshed) and Hunter (yellow-fleshed). The fruit of both of these varieties is soft, small, and sweet. The trees are somewhat less thrifty than peaches. Goldmine has been more productive than Hunter. Peaches have undergone more widespread planting and testing than nectarines, which may be the chief reason why better varieties of the former are available. A third variety, Sure Crop, has been planted at Wooster, but the trees are not yet of bearing age. For limited local sales the novelty of the fruit may attract enough attention to warrant the planting of a few nectarines in the orchard.

APRICOTS

The planting of apricots is not recommended in Ohio. The superior varieties of the West are not well adapted to this State. Those varieties which thrive here rank poor to only fair in fruit characters.

CHERRIES

GROUPS OF CHERRY VARIETIES

Sweet cherries are classified into two groups, each with light- and dark-colored forms. One group, the **Heart,** also known as *Guigne* or *Gean,* is characterized by varieties with soft flesh. Examples of Heart varieties are: *Dark-colored*—Black Tartarian; *light-colored*—Gov. Wood. The other group, the **Bigarreau,** is characterized by varieties with firm, crisp flesh. Examples of Bigarreau varieties are: *Dark-colored*—Windsor, Bing, and Lambert; and *light-colored*—Napoleon (Royal Ann).

Sour cherries are classified into two groups. Those with pale juice and light red fruits are called **Amarelles.** Examples of this group are Montmorency and Early Richmond. Sour cherries with very dark fruits and reddish juice are called **Morellos,** also known by the German name *Weichsel.*

Trees of the Morello group, for example, English Morello, Wragg, and Ostheim, are more dwarf, spreading, and bushy than those of the Amarelle group.

Characteristics of varieties of the **Duke** class grade between sweets and sours. Some examples of the Duke group are May Duke, Reine Hortense, and Brassington.

CHARACTERISTICS OF VARIETIES

SOUR CHERRY VARIETIES

Baldwin.—Earlier, darker in color, milder, and less productive than Early Richmond. One of the best in quality for home pie-making. July 3[1].

Dyehouse.—A few days earlier and slightly lighter in color than Early Richmond. July 8.

Early Richmond.—Earlier than Montmorency. Fruit often small and consequently not so well adapted as Montmorency for canning or freezing purposes.

Montmorency.—Fruit well known and favorably received by the trade. By far the best sour cherry for commercial purposes. There are a number of "strains" of Montmorency, all of which are good. The "Farnsworth" strain has proven satisfactory in commercial plantings and probably is the leader in Ohio. Several good strains which originated in Michigan are reported as desirable for extending the Montmorency season somewhat. Ripens midseason; thrifty; productive tree. July 20.

Chase.—Relatively new. Dark red flesh and juice. Fruit a little larger and with tougher skin than English Morello. The fruit is also better distributed throughout the tree, the branches are less drooping, and it is a little earlier than English Morello. July 25.

Fig. 5.—Showing difference in bloom of sweet and sour cherries at Wooster in 1927. The blossoms fell from the sweet cherries (left) before the sour cherries (right) were in full bloom. It is obvious that cross-pollination between the sweet and sour cherries is not likely.

English Morello.—Ripens late; dark red juice and fruit; highly susceptible to leaf spot; ripens unevenly. If the dark-colored fruits of this variety are mixed with the lighter-colored Montmorency in commercial canning or freezing, the product is not uniform and is therefore objectionable. The tree is low growing and spreading with drooping branches. August 4.

[1]First picking in 1932.

SWEET CHERRY VARIETIES

Windsor and Bing are the two preferred sweet cherry varieties. Several of the sweet cherries which are described are nearly as suitable as the selected two and possibly more desirable in some cases. Some limitations to the planting of sweet cherries in Ohio are: Injury to blossoms from spring freezes; cracking of the fruit as it nears maturity; loss of fruit from birds; injury of the southwest side of the trunk; brown rot; difficulty in starting trees, many failing to survive planting or growing slowly; need of all sweet cherry varieties for suitable cross-pollination; susceptibility of the sweet cherry to poor soil drainage.

Gov. Wood.—Pinkish yellow; soft flesh; hardy; thrifty tree; one of the most regular croppers. Fruit only medium size, often small when the crop is heavy. Ripens early and is often subject to ravages of birds. June 22.

Black Tartarian.—Blackish red; soft flesh; tall growing tree which becomes objectionable in the orchard; ripens early; often subject to ravages of birds. June 23 (estimated).

Victor.—Pinkish yellow; firm flesh; ripens slightly later than Gov. Wood. A new variety, worthy of more extensive trial. June 28.

Bing.—Dark red; firm flesh; best quality and appearance; tree comparatively small. Probably should be planted a little closer than other sweet cherries. Fruit subject to cracking at maturity, but somewhat less so than Lambert or Schmidt. June 30.

Napoleon (Royal Ann).—Pinkish yellow; firm flesh; best quality for a light-colored cherry. Very susceptible to rot unless thoroughly sprayed. July 4.

Yellow Spanish.—Yellow; firm flesh; large tree; not so heavy a cropper nor is the fruit so large and attractive as that of Napoleon. July 5.

Lambert.—Dark red; firm flesh; large tree but often short-lived; fruit of high quality. Unfortunately, the fruit is highly subject to cracking at maturity, probably even more so than is the case with other firm-fleshed varieties. Ripens slightly later than Bing. July 5.

Windsor.—Red; firm flesh; highly productive; good tree habit; comparatively long picking season; comparatively hardy and not resistant; freer from fruit cracking than some of the other varieties. July 5.

Schmidt.—Dark red; firm flesh. Trees planted in 1912 are still thrifty after 20 years in the orchards; some Ohio growers, however, have found the tree to be comparatively short lived. Fruit large and excellent in quality and appearance, subject to cracking, and ripens with Lambert, slightly later than Bing. July 6.

DUKE CHERRY VARIETIES

The varieties in this group are highly desirable for home pie-making.

Brassington.—Ripens between Early Richmond and Montmorency; rather weak tree; highly productive but fruiting area is less than with Montmorency; fruit mild and of good size. Ripens unevenly throughout the tree. July 10.

Reine Hortense.—Light red color; large; not quite so mild as some of the other Dukes. The fruit is difficult to pick "without stems". Tree larger than Brassington; branches interlace considerably and they also break very easily when picking. Picking is slow and required over a comparatively long period. July 10.

May Duke.—Much like Brassington in characteristics, but the fruits are not quite so desirable. July 10.

TABLE 5.—Cherry Blooming Dates, Wooster. 11-year Average, 1922-1932

Variety	First bloom	Full bloom	Last bloom
Windsor	April 20	April 23	April 26
Ida	21	24	26
Schmidt	21	26	30
Napoleon	21	24	27
Bing	21	24	27
Gov. Wood	21	24	27
Elton	21	24	27
Rockport	22	25	28
Ohio Beauty	21	24	27
Yellow Spanish	21	25	28
Lambert	22	25	28
Mercer	22	25	28
Burbank (8-year average)	21	24	26
Baldwin	22	27	30
Olivet	24	28	30
Reine Hortense	23	26	29
Brassington	23	25	28
Empress Eugenie	24	26	30
May Duke	24	27	30
Louis Philippe	24	28	30
Bender	24	29	30
Ostheim	24	28	30
Koontz Mammoth	25	29	May 1
Late Duke	24	28	April 30
Royal Duke	26	29	May 1
Abesse	26	29	1
Early Richmond	26	30	1
Dutchess	26	30	1
Brusseler Braune	26	30	1
Montmorency	26	30	2
Homer	29	May 2	5
English Morello	30	2	4
Wragg	30	2	4

TABLE 6.—Comparative Yields of Some Varieties of Sweet Cherries. 1932*, Wooster

Trees planted in 1912

Variety	Tree No.	Marketable fruit	Non-marketable fruit†	Total yield
		Qt.	*Qt.*	*Qt.*
Elton	105	220	106	326
Windsor	72	245	8	253
Lambert	116	207	12	219
Lambert	117	199	12	211
Windsor	74	202	8	210
Rockport	3	172	15	187
Windsor	70	174	8	182
Rockport	1	155	15	170
Schmidt	103	154	12	166
Lambert	80	144	8	152
Napoleon	33	116	30	146
Lambert	79	132	8	140
Schmidt	103	114	12	126
Windsor	147	125	0	125
Ida	67	99	24	123
Windsor	148	110	12	122
Ida	87	96	24	120
Lambert	81	101	12	113
Yellow Spanish	41	82	24	106
Napoleon	31	70	30	100
Ida	69	71	18	89
Bing	64	77	0	77
Schmidt	36	66	8	74
Reine Hortense (Duke)	109	66	0	66
Ida	48	44	18	62
Mercer	37	40	0	40
Montmorency (sour)	17	90	0	90

*This crop followed an exceptionally heavy crop in 1931.
†Including mostly fruit infected with brown rot.

PLUMS

GROUPS OF PLUM VARIETIES

The Japanese plums (*Prunus salicina*) may be classified into two groups: (a) Those with yellowish flesh, as the Burbank and Abundance, and (b) those with red flesh, as the Satsuma. Many hybrids of the Japanese plums and other species occur. The hybrids, or derivatives, such as Wickson and Shiro, are often relegated for convenience to the Japanese or Oriental group. In this event, a further distinction may be made as to skin color; as a rule, the skin color of most Japanese varieties is reddish but that of Shiro is yellowish.

The large-fruited European plums (*P. domestica*) may be divided into at least five groups: Prune, Gage, Imperatrice, Lombard, and Yellow Egg. Fruits of the Prune group are: Blue, purple, or reddish in color; oval, often compressed on one side; mostly freestone; good quality, with a high percentage of solids. All prunes are plums, but all plums are not prunes. Prunes are capable of being dried with the seed in them without fermenting; whereas most plums would ferment. Examples of the Prune group are Italian Prune, German Prune, French Prune, and Imperial Epineuse. The prunes may be divided into those with blue color, as German Prune and Italian Prune; those with reddish purple color, such as French Prune and Imperial Epineuse; and those still more red, as Giant Prune. In Ohio, members of the prune group are called prune plums. Fruits of the Gage group of plums are greenish-yellow in color; round or oval in shape; free to semi-free; and of high quality. Examples of the Gage plums are Reine Claude, Washington, and Imperial Gage. Fruits of the Imperatrice group are mostly blue, thick skinned, firm, often at least partly clingstone, and of only fair quality. Examples of Imperatrice plums are Grand Duke, Arch Duke, Diamond, Monarch, Arctic, and Shipper's Pride. Fruits of the Lombard group are purplish red in color, only fair in quality, and clingstone. Lombard and Bradshaw are examples of the group. Fruits of the Yellow Egg group are attractive, clingstone, and of poor dessert quality. The Yellow Egg variety is the best known example of the group.

Damson plums (*P. institia*) form an important part of the plantings in certain parts of the State, the best demand probably being in the southern part. Bulletin 422 of the Ohio Experiment Station contains descriptions of varieties of Damsons (8).

CHARACTERISTICS OF VARIETIES

Wild Goose.—A red, native plum whose outstanding characteristic is its earliness. The fruits usually drop before they are ripe and are picked up from the ground. It is a very juicy plum. Except for its earliness, its characteristics for the most part are inferior ones. July 22[2].

JAPANESE PLUMS

Shiro (August 1), Wickson (August 4), Red June (August 12), Maynard (August 14), Abundance (August 14), and Burbank (August 18) are varieties of the so-called Japanese group. Plums of this group are suited more for eating out of hand than for canning and other culinary purposes. When well grown and sufficiently ripe, the Japanese plums are of some usefulness for roadside market purposes as they ripen earlier than the European varieties.

[2]First picking at Wooster in 1932.

They bloom early and are sometimes damaged by frosts in the spring when the later-blooming European varieties escape. They are, as a group, more susceptible to rot than the European varieties. The first four varieties mentioned are reddish in external color with yellow flesh. Both the skin and flesh of Shiro are yellowish. There are, of course, some differences in fruit characters of these reddish-colored varieties, but a selection from them is probably influenced more by time of ripening and by tree characters. The tree of Burbank is outstandingly flat-topped. Abundance is probably the most productive; Wickson is probably the least productive but has the largest fruits.

TABLE 7.—Plum Blooming Dates, Wooster. 11-year Average, 1922-1932

Variety	First bloom	Full bloom	Last bloom
Red June	April 19	April 23	April 25
Wickson	19	23	25
Burbank	19	23	25
Abundance	22	25	27
Shiro	19	22	25
Bradshaw	24	27	29
Reine Claude	22	24	27
Gueii	23	25	28
Grand Duke	22	26	27
Imperial Gage	23	25	28
Lombard	23	25	28
Washington	23	25	28
Tragedy	23	25	28
Shipper's Pride	25	28	30
Shropshire Damson	26	28	30
Wyant	25	28	30
Finch Damson	27	29	May 1
German Prune	27	29	1
Maloney Prune	27	29	1
Pond	26	27	1
Pringle Damson	27	28	1
Terry	27	29	April 30
Yellow Egg	26	28	May 1
York State	28	29	1
Desota	28	30	1
Free Goose	29	30	2
Wild Goose	28	30	2
Waneta	25	26	2
Downing	30	31	3
Imperial Epineuse (2-yr. av.)	May 1	May 4	6
Pacific	April 28	1	3
Hall	22	April 26	April 29
Riley Damson	23	25	28
Beauty of Naples	24	27	29
Crimson Drop	23	26	28
French Prune	25	27	30
Musselman Damson	24	28	29
General Hand	24	27	30
Peters	23	26	29
Standard	24	27	30
Victoria	24	27	29
Victory	23	25	28
Brittlewood	26	28	30
Crittenden Damson	26	28	30
French Damson	25	28	30
Giant Prune	26	27	30
Jefferson	26	28	30
Kelso Damson	25	27	29
Palatine	25	28	30
Pearl	26	28	30

EUROPEAN PLUMS

A revival of interest in plums would seem to be dependent, in part, on fruit of higher quality than occurs in Lombard, Arctic, Shipper's Pride, and many other varieties which have commonly been planted. The chief demand has been for plums which are blue in color, particularly the prune-type plums.

The following list is preferred to comprise the main plantings: Stanley, Italian Prune, German Prune, and Hall. It would seem a good plan to include a few trees of the Reine Claude green gage in any plum planting.

Bradshaw.—Tree upright; often grows slowly and comes into bearing late; bears medium crops; fairly regular fruit; large; reddish-purple. One of the earliest ripening of the European plums; soft; quality fair to poor. September 4.

Yellow Egg.—Yellow; clingstone; poor quality. Formerly widely planted, but few plantings of it are being made at present.

Imperial Epineuse.—Tree character satisfactory in the orchard but poor in the nursery. Fruit reddish-purple, only fair appearance; especially rich flavor; stone semi-free; size variable, mostly large. September 10.

Stanley.—Blue. Its behavior so far has been very promising. September 12.

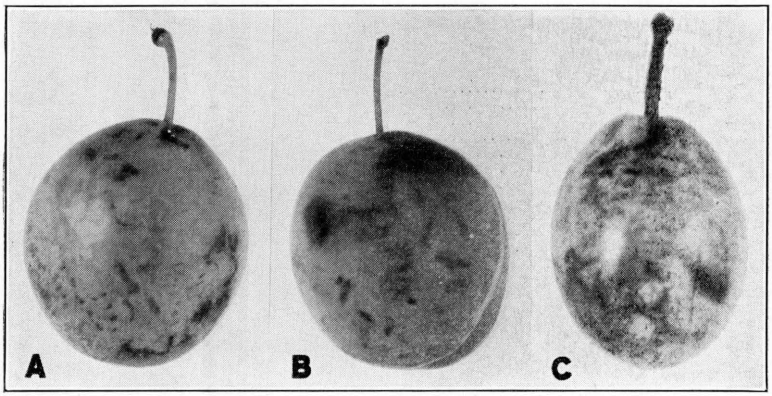

Fig. 6.—A. Imperial Epineuse plum. B. Hall plum. C. Stanley plum

Lombard.—Reddish. Probably planted more extensively than any other variety in Ohio. Its good points are: It is a thrifty, hardy, productive, widely adapted tree, and the fruit is useful for culinary purposes. Its objections preclude higher ranking. It lacks quality as a fresh fruit and, in fact, for canning when compared with certain other varieties. Too often the fruit lacks the size, appearance, and freedom from rot to make it suitable for anything but a low-price market. September 14.

Italian Prune.—Tree comparatively widespreading; possibly a little less productive than some of the German Prune strains; comes into bearing somewhat earlier than German Prune but often later than most other varieties. It is preferred, on the whole, to German Prune because of superior tree characters for the orchard, large fruit, somewhat better quality, and because of the strain situation. September 16.

German Prune.—Tree upright, slow in coming into bearing. Fruit blue; freestone; medium size; excellent quality for canning. There is evidently a number of different strains of this variety, and German Prune and Italian Prune are sometimes confused. German Prune, as extensively grown in Ohio, is, on the whole, satisfactory, in spite of differences which exist in the variety. Some strains of German Prune do not deserve the highest ranking. September 16.

Arch Duke.—If plums were not so frequently "a glut on the market", this variety would probably deserve higher ranking. While Arch Duke is by no means poor in quality, yet it hardly deserves first ranking in this respect. The tree is vigorous and prolific. The fruit is purplish blue, with a heavy bloom; large; firm flesh and skin; comparatively free from rot; stone partly free. The comparatively long picking season is objectionable to some and favorable to others. September 17.

Hall.—A new plum; large fruit with a semi-free stone which has shown promising behavior. September 20.

Pond (Pond's Seedling Murdy).—Tree somewhat lacking in vigor and hardiness; not heavily productive. Fruit reddish; very large; poor quality. September 20.

Grand Duke.—Purplish blue. A little larger and ripens later and more uniformly than Arch Duke. Tree is comparatively slow growing. It is a fairly good variety but, on the whole, is considered slightly inferior to Arch Duke.

Reine Claude.—Tree only fair in vigor; comparatively short lived; comparatively small in the nursery; more regularly productive than some of the other varieties. Fruit—yellowish-green; round; stone nearly free; high quality for dessert or canning purposes; ripens late. The demand for the fruit of this variety is good in local sales but blue-colored varieties usually command a larger market. October 8.

French Damson.—As grown in the Ohio Experiment Station orchards, French Damson is superior to Shropshire in size, appearance, and quality of fruit but inferior to it in thriftiness of tree. The color is bronzed purple. The characteristic tart, spicy flavor makes damsons especially desirable for preserves and for other culinary purposes. The fruit is borne in quantity, is small in size, and somewhat tedious to pick. It can be gathered readily, however, when shaken on canvas or other suitable material spread under the tree. The trees are hardy and vigorous, possess wide adaptability, and are relatively easy to grow. The best market seems to be in the southern part of Ohio. Under neglected conditions black knot is often serious, but it has caused little trouble at Wooster.

Shropshire Damson.—The most widely grown damson variety. Although somewhat irregularly productive, its tree habits are good. It is excelled by French Damson in fruit characters.

GRAPES

CHARACTERISTICS OF VARIETIES

A preferred list of grape varieties is as follows: Fredonia, Worden, Niagara, Delaware, Concord, and (in the lake region west of Cleveland) the Catawba. Comprehensive tests on varieties for grape juice purposes have been reported previously (12).

Portland.—Green-white. Earliness is its chief merit. Berries are large but assume an unattractive amber appearance and shatter easily when fully ripe. Only moderate vigor. Preferred to Winchell or Green Mountain. September 1[3].

[3]Date of first picking at Wooster in 1932. Grapes may be left on the vines while ripening for a long time compared with most other fruits. The time of picking varies greatly with the purpose for which the fruit is used.

Brocton.—Green-white. In the test vineyard it has been preferred to either Portland or Ontario in eating quality. Thin skin. September 8.

Champion.—Blue-black; poor quality. September 9.

Fredonia.—Blue-black. Ripens about with Moore Early and should replace it in future plantings because of higher yield. Quality only fair. September 10.

Campbell Early.—Blue-black. Would rank higher when properly grown under highly favorable conditions. Usually the variety cannot be recommended because of straggly bunches. Requires special pruning for best results. September 11.

Ontario.—Green-white; clearer juice, less foxy, and more tender skin than Niagara. September 11.

Diamond.—Green-white; good quality; tender skin. September 11.

Niagara.—Green-white; slightly less vigorous and productive than Concord; large bunch and berry; good quality when properly mature. Berry and juice tend to a brownish coloration, which is somewhat objectionable. Too often it is harvested before it is fully ripe. September 12.

Worden.—Blue-black. Quality is good, but the berries often crack or shell from the bunch in handling. September 12.

Delaware.—Red; small; high quality; vine rather small. Seems to require close pruning and heavy fertilizing for best results. Yield usually lower than from Concord. Harvesting per given quantity comparatively slow. September 12.

Brighton.—Purplish-red; large bunch; good quality; thin skin; self-unfruitful[4]. September 14.

Concord.—Blue-black; most widely grown variety in Ohio. The vine is hardy and productive on a wide range of soils and conditions, and the yield is high. The fruit ripens evenly, is firm enough to stand reasonable shipment, and is well suited for many purposes. September 15.

Lindley.—Red; good quality; self-unfruitful; bunches often somewhat straggly[4]. October 5.

Caco.—Red; large berry; small bunch. Sweet because of low acidity rather than high sugar content. September 20.

Captivator.—Red; high quality; unattractive appearance; plant rather tender in some plantings, though thrifty at Wooster. September 20.

King.—Blue-black; berries larger and bunches more straggly than in Concord. September 15.

Ives.—Blue-black; a poor table grape. Sometimes has brought a premium for wine purposes. Growth and yield often none too satisfactory. September 30.

Salem.—Red; large berry; self-unfruitful[4]. October 5.

Agawam.—Red; sweet, but fairly foxy flavor; thick skin; coarse pulp. October 5.

Sheridan.—Blue-black. About the only major fault which has so far become apparent is that it may ripen too late for wide adaptation throughout the State.

Catawba.—Red. For planting on the islands in Lake Erie and in Ottawa and Erie Counties only; elsewhere it does not mature properly. Requires proximity to a deep body of water. October 30.

[4]Other varieties from which pollen may be transferred by bees should be nearby.

EUROPEAN-TYPE GRAPES

Attempts were made as early as 1616 to grow the European grape (*Vitis vinifera*) in the eastern part of the United States. These attempts and many subsequent ones up to the present time have been unsuccessful. It eventually became known that European grapes were not adapted to growing in the East. Their commercial culture would be restricted to California or regions of similar climate, and dependence must be placed here on improved native derivations. Even if European varieties are afforded winter protection in Ohio, there are still such limiting factors as length of season and other weather and soil conditions. Survival of the winter does not mean that the European grapes when grown in Ohio will be equal in quality or other respects to the same varieties grown in California. Perhaps, some day a European-type grape may be developed which will be well adapted to Ohio but that day is not yet here.

STRAWBERRIES

CHARACTERISTICS OF VARIETIES

Premier is the preferred variety for either commercial or home planting. Other varieties possess some special merits, but no other one can properly be selected as suitable to a wide range of conditions. Comparatively more new varieties of strawberries than of other fruits appear each year. Information based on our tests will be gladly supplied on particular varieties. One reason for not describing more strawberry varieties is that the interest in the new sorts varies greatly from year to year.

Aberdeen (per).—The characteristics of this variety are discussed in considerable detail in the Bimonthly Bulletin for November-December, 1932 (11). In brief, it is one of the most productive of the later ripening varieties and is a thrifty plant maker. The chief objection is the softness of fruit.

Amanda (per).—Fruit large, irregular, soft. A midseason variety which has found some favor in the area west of Cleveland.

Aroma (per).—Although ranking second in acreage in America, it is primarily a shipping berry, and it has not proven well adapted to Ohio conditions.

Beaver (per).—Unsatisfactory; poor plant maker; berries small.

Belt (Wm. Belt) (per).—Fruit—Irregular, large, soft, dark red, fine-grained, mild, good quality. Only moderately productive. Highly susceptible to leaf-spot diseases.

Blakemore (per).—In limited trial it has not seemed well adapted to Ohio conditions. The berry is bright red and uniformly colored but rather small, somewhat tough, and fairly acid. Plant so vigorous as to become almost an objectionable feature. Excellent canning and preserving qualities.

Chesapeake (per).—A showy, high quality, late midseason variety that makes few runners. Under irrigation it might be well adapted to some plantings in Ohio, particularly those on sandy soil.

Cooper (per).—Sweet, soft, whitish center, variable size; irregular production; large plant.

Dunlap, Senator Dunlap (per).—Fruit—Conical, necked, small to medium, soft, rich red, fine grained, high quality. Very prolific plant maker; plants small. Ripens early midseason. Cans well.

Gandy (per).—Its chief merit is lateness, but low production is a serious handicap.

Gibson (Parsons Beauty, sometimes also **Pocomoke)** (per).—Productive; thrifty plants; fruit dark and soon becomes unattractive in appearance; briskly subacid. Good plant maker. Held in some esteem for commercial preserving.

Glen Mary (semi-per).—Berry frequently with light-colored tips. Early blossoms hardly produce enough pollen for themselves. Production somewhat unreliable. It has been profitable with a few growers but cannot be generally recommended.

Howard Supreme (imp).—The peak of its picking season is slightly later than that of Premier. Retains its color well in canning and apparently is well adapted to frozen-pack preservation. The dark color of the berries detracts from their appearance on the fresh fruit market. The fact that it is imperfect is an objection.

Premier[5] (per).—It has rapidly become the third leading variety in the United States, being exceeded only by Klondike and Aroma which are extensively planted in southern regions. The plant is highly productive. Fruit ripens in early midseason and over a comparatively long period; it is attractive and of good quality though not of the best quality or firmness. The variety is sometimes only a fair plant maker, but often this fault is associated with the practices followed rather than being due entirely to inherent characteristics. Comprises about 75 per cent of the commercial plantings in Ohio.

Sample (imp).—Ripens late midseason, extending the Premier season a little. Fairly good size of berry when adequately cross-pollinated. Darker and less productive than Premier.

Town King (per).—Large; poor quality; only fair yield.

Washington (per).—Its behavior at Wooster has been unsatisfactory (11).

FALL BEARING

Only in exceptional cases is it profitable to grow the so-called everbearing strawberries. This type of strawberry produces crops in the fall and spring. The fall crop ripens "out of season". This results in a higher price for the fruit but a comparatively limited demand. The fall crop ripens over a period of several months instead of several weeks as is the case with the June-bearing varieties; therefore, the picking expense per given area is comparatively high. Although a crop is produced the same year that the plants are set, as a rule the yield is low and many berries do not develop properly. The few profitable fall crops in Ohio that have come to our attention have been located on a low, moist, rich site and where high-class hotel or restaurant trade has furnished the market. In most home gardens the fall crop has received a certain amount of favor, more or less as a novelty endeavor. Most fall-bearing varieties are notably shy plant producers. The leading fall-bearing variety, at present, is *Mastodon.* It has been an improvement over the older varieties, *Progressive* and *Superb,* but it is highly susceptible to leaf-spot diseases and, on the whole, has not proven very satisfactory for either commercial or home garden purposes.

BLACK RASPBERRIES

CHARACTERISTICS OF VARIETIES

Caution: It is inadvisable to locate black raspberry plants near reds, purples, or diseased wild or cultivated brambles. At least 20 rods should separate the blacks and other types.

[5]Properly Howard 17 or Howard.

New Logan.—One of the most resistant varieties to virus diseases and to drouth. Begins to ripen from a few days to a week earlier than Cumberland in mature plantings. Fruit characters less desirable than those of Cumberland. Plants lower growing than Cumberland, especially in the first year or so; as susceptible to anthracnose and crown gall as Cumberland.

Plum Farmer.—Ripens about with New Logan but with a shorter season. Quality of berries not as good as that of Cumberland. Largely being replaced by New Logan.

Cumberland.—The best variety when well grown. Highly susceptible to diseases. Stock of this variety, exceptionally free from virus diseases (but, of course, not immune to the diseases), is available in Ohio. Ripens midseason.

Black Beauty.—A new midseason variety introduced in Ohio in 1932. Outstandingly vigorous. Apparently more resistant to diseases (including anthracnose) and to drouth than is Cumberland. A little inferior in fruit characters to well grown Cumberland.

Gregg.—Formerly the leading late variety but now little planted because of its high susceptibility to disease and the difficulty in locating plants free from disease.

Kansas.—Not a very satisfactory berry but has been planted by some growers because of its high degree of disease resistance. It ranks below New Logan.

Pearl.—Remarks the same as for Kansas.

RED RASPBERRIES

CHARACTERISTICS OF VARIETIES

(In order of ripening)

June (Ontario).—The early season of ripening is outstanding. The berry characters, in general, are only fairly good. It is more capricious than Latham with respect to site requirements; it apparently does best on the heavier and more fertile soils.

Ranere (St. Regis).—Ripens early in the summer and bears a light crop on the new growth in the fall. Thrifty plant. The berries usually are small and picking is slow. Poor quality.

Chief.—The berries are not so large as could be desired, and picking is comparatively slow; otherwise, it has proven satisfactory in thriftiness of plant, yield, and quality. About a week earlier than Latham.

Cuthbert.—For many years it was the leading midseason variety in Ohio. Still fairly extensively planted. When well grown it is considered superior to most other varieties in dessert and canning qualities. Under average conditions it is outyielded by certain other varieties; picking is comparatively slow and expensive; muskiness predominates over the rich flavor; the color of the berries is not uniform; and the canes sprawl undesirably.

Viking.—In at least one commercial planting in northern Ohio it has been outstanding in its behavior. More uniform and slightly lighter in color than Cuthbert and crumbles less than Latham. It is probably somewhat capricious in its site requirements. In some cases it has not been so hardy as could be desired. It seems worthy of trial by those who are not satisfied with the Latham type of berry. Like Cuthbert, to be satisfactory it needs to be grown with better than average care.

Newburgh.—Limited test seems to indicate a good deal of promise for more extensive planting. Fruit large and less crumbly than Latham. The firmness of berry is a prime feature for commercial purposes. Ripens about with Latham or a few days earlier. Plant thrifty; comparatively free from disease. The low-spreading branches indicate a need for support.

Latham.—Ripens midseason; long picking season. The most highly productive variety throughout Ohio. Large fruit; picking is rapid in comparison with other red varieties. Fruit only fair in quality, tends to crumble; large core cavity. Thrifty plant.

Marlboro, King, Newman, Herbert, Van Fleet, Adams 87, Adams 101, Ohta (Flaming Giant), and a number of others have not proven well adapted to Ohio conditions.

PURPLE RASPBERRIES

CHARACTERISTICS OF VARIETIES

The value of any purple raspberry is limited at present in Ohio.

Columbian.—Purple raspberries, in general, are more highly productive than either black or red raspberries. The dark color of the berries when ripe and their brisk flavor have been drawbacks to extensive planting for fresh market purposes. If the purple were to grow in popularity it could probably be produced at lower cost than the other types. Columbian, in the northern part of the State, at least seems to meet most requirements which a purple raspberry has been expected to fulfill.

Cardinal.—Possibly somewhat better adapted than Columbian to the southern part of the State.

Potomac.—A new variety which, in limited trial, has shown up well.

BLACKBERRIES

CHARACTERISTICS OF VARIETIES

Mersereau.—Susceptible to orange rust and none too satisfactory in propagation.

Eldorado.—The berry is not the largest nor is the plant the most vigorous or productive. But, with all factors considered, it is, as it has been for some time, the first choice. With Eldorado, as with most other blackberry varieties, stock is not always obtained so true-to-name as could be desired. True Eldorado is seldom seriously affected by orange-rust disease.

Alfred.—Reports received from growers in the State seem to indicate that this variety is reasonably satisfactory but that Eldorado is preferred.

Blowers.—When maintained free, or relatively so, from orange rust, this variety is outstanding in the size of berry and vigor of its erect type of growth. Its high degree of susceptibility to orange rust ranks it below Eldorado in dependability.

Erie.—Ripens somewhat later than Eldorado. Esteemed by a few growers west of Cleveland. Ususally the quality is only fair.

DEWBERRY AND TYPES WITH TRAILING GROWTH

None of the varieties with the trailing or almost trailing type of growth have proven well adapted to Ohio. Included in the list are: Lucretia dewberry, Brainerd blackberry, Loganberry, and Youngberry.

CURRANTS

CHARACTERISTICS OF VARIETIES

Cherry.—Unproductive when true to name. The Cherry offered in the trade is usually some other variety.

Perfection.—Berries larger than those of Wilder. As a rule, the plant lacks desirable vigor and throws comparatively few canes from below soil level. The fruit scalds easily on the bushes.

Wilder.—A vigorous, productive variety, with good fruit and a long season. The most dependable red currant for Ohio.

Red Lake.—A promising new, late-ripening variety.

Diploma, Fay, Filler, London Market, Long Bunch Holland, Pomona, Red Cross, and **Victoria** are only fairly good varieties in Ohio.

The **White Grape** is probably the best white currant, but this fruit is of little commercial value.

The planting of black currant varieties is not encouraged, even by those who like this fruit, because part of the life cycle of the white pine blister rust may be passed on the bushes of this fruit.

GOOSEBERRIES

CHARACTERISTICS OF VARIETIES

Carrie.—A hardy, productive variety with small fruit which is red when ripe.

Como.—Green fruit; productive; not widely tested in Ohio.

Downing.—Thrifty; vigorous; and highly productive. Easy to propagate. Fruit—pale green, small to medium, and comparatively smooth.

Glenndale.—Apparently, its chief role is for planting near the southern boundary of gooseberry growing where other sorts die out or are grown with difficulty.

Houghton.—Widely grown and highly productive. Fruit dark red, small.

Poorman.—One of the largest fruited American sorts. Red. Thorns less objectionable than in most sorts. Has not yet fruited at Wooster.

BLUEBERRIES

Inquiries occasionally are received on the possibilities of growing blueberries in Ohio. As a matter of fact, according to the 1930 Census an acreage of 15 acres and a production of 4,610 quarts are listed for Ohio, mostly in Portage County.

The blueberry industry in the United States is of several types: (a) The "wild" plants, as in Maine, where the species *Vaccinium pennsylvanicum* (low) and *V. canadense* (half-high) predominate; (b) the southern blueberry, chiefly *V. virgatum* (which grows about 15 feet high); (c) the improved or cultivated blueberry, *V. corymbosum.* Usually the requests for information are about the last type, which in a suitable habitat is useful for the large fruit and the ornamental plant.

The words blueberry and huckleberry sometimes are used interchangeably. A simple distinction may be made, however, on seed characteristics. There are many small inconspicuous seeds in blueberries; whereas there are only a few seeds or pits in the huckleberries and these are large.

Soil adapted to blueberry culture is acid in reaction (about pH 5.0), contains some peat or other partially rotted vegetable matter and also some sand, provides a constant moisture supply, and yet may be well drained. Experience on successful culture of blueberries is lacking in Ohio, and attempts to grow this fruit should be restricted in accordance with the limited information available. Where it is desired to make an effort to grow a few plants for trial purposes on soil which is not naturally blueberry soil, it is suggested that they be mulched with acid peat and that aluminum sulfate be applied at the rate of ½ pound to 50 square feet, or as needed to provide a proper reaction.

LITERATURE CITED

(1) Ellenwood, C. W. 1927. Golden Delicious Apple, Its Spraying, Picking, and Storage. Ohio Agr. Exp. Sta. Bimo. Bull., Vol. 12, No. 4, July-August.

(2) Ellenwood, C. W. 1931. Bloom Period and Yield of Apples. Ohio Agr. Exp. Sta. Bull. 472.

(3) Gourley, J. H. and C. W. Ellenwood. 1926. Dependable Fruits. Ohio Agr. Exp. Sta. Bull. 394.

(4) Howlett, F. S. 1927. Apple Pollination Studies in Ohio. Ohio Agr. Exp. Sta. Bull. 404.

(5) Howlett, F. S. 1931. Factors Affecting Fruit Setting—Stayman Winesap. Ohio Agr. Exp. Sta. Bull. 483.

(6) Lewis, I. P. 1924. Planting the Orchard. Ohio Agr. Exp. Sta. Bimo. Bull., Vol. 9, Nos. 3 & 4, March-April.

(7) Shoemaker, J. S. 1928. Cherry Pollination Studies. Ohio Agr. Exp. Sta. Bull. 422.

(8) Shoemaker, J. S. 1928. Fruit Varieties in Ohio, III—Damson Plums. Ohio Agr. Exp. Sta. Bull. 426.

(9) Shoemaker, J. S. 1929. The Strawberry in Ohio. Ohio Agr. Exp. Sta. Bull. 444.

(10) Shoemaker, J. S. 1930. Raspberries and Blackberries in Ohio, Culture. Ohio Agr. Exp. Sta. Bull. 454.

(11) Shoemaker, J. S. 1932. The Aberdeen and Washington Strawberry Varieties. Ohio Agr. Exp. Sta. Bimo. Bull., No. 159, Nov.-Dec.

(12) Thayer, P. 1919. Grape Juice. I Making, II Varieties for. Ohio Agr. Exp. Sta. Monthly Bull., Vol. 4, No. 8, Aug.

(12) Thayer, P. 1919. Making Grape Juice. Ohio Agr. Exp. Sta. Monthly Bull., Vol. 4, No. 8, Aug.

(13) Thayer, P. 1919. Varieties of Grapes for Juice. Ohio Agr. Exp. Sta. Monthly Bull., Vol. 4, No. 8, Aug.

* * * * * * * *

Additional Bulletins on Varieties of Fruit, published by the Ohio Agricultural Experiment Station.

Bull. 290.	Varieties of Apples in Ohio.
Bull. 371.	Red and White Currants.
Bull. 391.	Fruit Varieties in Ohio I.
Bull. 407.	Fruit Varieties in Ohio II.
Bull. 411.	Varieties of Apples in Ohio II.
Bull. 434.	Fruit Varieties in Ohio IV—Crab Apples.
Bimo. Bull.	July-August, 1927—Golden Delicious Apple.
Bimo. Bull.	Mar.-Apr., 1931—Three Promising New Varieties of Small Fruits—Howard Supreme Strawberry, New Logan Black Raspberry, and Chief Red Raspberry.

This page intentionally blank.